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Adelman, Margaret McColl, "Clean and Healthy Hands: A proposal to Improve the Quality of Infection Control in UT Residence Halls" (2007). *Chancellor's Honors Program Projects*.
https://trace.tennessee.edu/utk_chanhonoproj/1037

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CLEAN AND HEALTHY HANDS:

**A PROPOSAL TO IMPROVE THE QUALITY OF
INFECTION CONTROL IN UT RESIDENCE HALLS**



Clean and Healthy Hands

A Proposal to Improve the Quality of Infection Control in UT Residence Halls

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University Honors

College of Nursing

May 1, 2007

The alarm clock goes off at 7:00 am. Anne has got a full day of classes ahead of her. She walks down the hall, opens the bathroom door, uses the restroom, brushes her teeth, and dresses for class. She takes the elevator to the first floor and walks outside of Massey. Heading to Sophie's cafeteria she walks over the University of Tennessee bridge holding the rail. She grabs a tray, silverware, and a glass and eats a quick breakfast. Running a little late, she heads up the hill to Hodge's and pays for a Starbucks coffee with cash. After getting her change, she runs to The Commons to use a computer and print a paper due in her first class. After sprinting over to the nursing building, she grabs a previously read Beacon tucked underneath a desk chair and takes her seat for her first class of the morning at 8:05.

Take a moment to review Anne's morning. Now consider everything she touched. In just the first hour of her day, she has encountered several opportunities for infection transmission without once stopping to clean her hands. This is the typical situation for the average college student.

Infection control is a simple precautionary implementation that prevents contamination of an individual and subsequent illness. By ensuring that a student's hands are germ-free, the risk for infection is significantly decreased. Despite the simplicity of this intervention, many college students are not compliant. The resulting consequences have significant negative effects on both the student and the University as a whole.

To improve the quality of infection control at the University of Tennessee, I am proposing a two-fold plan of action: implement an education plan for students residing in residence halls on hand washing and provide alcohol-based hand sanitizer as an adjunct to traditional hand washing. The following proposal will explore the need for this program as well as outline the resulting benefits for both the college student and the University.

Clean and Healthy Hands

Why is it important?

Hands are considered to be the primary mode of infectious diseases, especially for those living in close proximity such as college residence halls.¹ Because of the frequent contact with hands and multiple surfaces, the incidence of cross-contamination is significantly increased. Residence halls are at risk due to the community environment. Particularly at the University of Tennessee, students in residence halls are using the same community bathroom, eating, food preparation, and living areas. The opportunity for coming in contact with a pathogen is more likely.

According to the Center for Disease Control and Prevention (CDC), hand washing is the single most important and effective method of preventing disease transmission.² In conjunction with the American Society for Microbiology, The Soap and Detergent Association (SDA) conducted a survey to test public knowledge about this concern. The results indicated that half of the participants recognized hand washing as the primary way to prevent colds and the flu and the vast majority practiced these measurements consistently.³ However, when comparing the survey to actual observation research studies, the SDA found that there is a “gap between what people say and what they do.”^{3,4} Particularly in school-settings, keeping your hands clean is typically restricted by time constraints and access to bathroom facilities.¹ The research indicates that compliance of hand hygiene is largely dependent on three main factors: 1.education on the use and benefits, 2.availability of appropriate facilities, and 3.convenience of method.

How is it effectively achieved?

The success of infection control implementations is highly dependent on the method's efficacy in decreasing pathogens as well as the accessibility to participants. Traditional hand

washing with soap and water is initially considered to be the best implementation.⁵ However, alcohol-based hand sanitizers are more convenient, particularly to student-life. So which is better?

Hand washing is an effective means of eliminating germs. As mentioned previously, it is the most important way to prevent infection transmission.² It is the most standard practice available and instilled in most students in early childhood. However, hand washing compliance is a significant concern. The required facilities, such as sinks, soap, and paper towels, are not always available. An even more significant problem for college students is the amount of time it takes to wash their hands. The busy schedule of a student and the on-the go lifestyle is a deterrent to thorough hand washing. Many people are also uneducated about the appropriate and effective way to wash hands.

Alcohol-based sanitizers offer resolutions to many of the problems presented by traditional hand washing. Their use requires no water or paper towels. No additional education is needed to make the product effective. Alcohol-based sanitizers were also found more effective than antimicrobial soaps.^{2,6} Despite the increased effectiveness and compliance, hand sanitizers are not useful in all situations. The CDC confirms that alcohol-based hand sanitizers are “not appropriate for use when hands are visibly dirty or contaminated.”² The use of hand sanitizers as opposed to traditional hand washing does not provide for all student needs.

The advantages and drawbacks of both hand washing and the use of hand sanitizers serve to conclude that a combination of both is the most effective.^{6,7} Hand washing should be reinforced as the primary method of decreasing infection. In addition, alcohol-based hand sanitizers should be encouraged in situations when hand washing is unavailable.

Proposal

The risk of infectious diseases for University of Tennessee students can be easily reduced by simple interventions. Based on this information, I am encouraging the University to implement the following proposals in Massey Hall to promote a healthy lifestyle for students and the campus as a whole.

Hand washing education

Hand washing seems like a simple task instilled in childhood. By college, most students would be expected to wash their hands out of habit. However, as easy as it may seem, research shows that not all people wash their hands enough. The SDA Survey indicates that 68% wash their hands before eating lunch, 92% after using the restroom, and only 28% after coughing or sneezing.³ The observational study performed in conjunction with the survey indicated that these percentages are actually less than reported when seen in real life settings, particularly events with large amounts of people in close proximity.⁴ The efficacy of hand washing is dependent upon proper execution. The CDC recommends washing hands with a generous amount of soap for at least 20 seconds in with warm water.³ Observing this standard is not commonly practiced.

To encourage and promote frequent and effective hand washing, I am proposing that the University encourage education through the use of visual aides in Massey community bathrooms.(Figure 1)⁸ In a research study performed at the University of Colorado, residence hall inhabitants reported that the bathroom was the most visible and effective placement for the visuals, with 96% of students encountering them.⁷ The aides instruct students of the proper technique to effectively wash hands. They also serve as a reminder to prompt students to wash their hands.⁷ Similar posters were hung in hospital staff restrooms in a nurse-led research study to determine if education could improve basic hand washing habits. The results of the study

indicated that hospital staff participating in proper hand washing jumped from 51% to 83%.¹¹

The use of visual aides effectively educates and reminds students in Massey Hall to wash their hands.

Education can also be implemented by requiring the resident advisor to conduct an education session at the beginning of each semester. Since the resident advisors are already required initiate education programs, this will be easily incorporated into the existing program. By requiring a hand washing education session, the University can ensure that residence hall inhabitants receive the information necessary to achieve improved health at no cost to the University.

Hand sanitizer installation

Additionally, using hand sanitizer will improve the health of residence hall inhabitants by decreasing the risk of infectious disease transmission. Four elementary schools implemented the regular use of alcohol-based hand sanitizer to document the effects on illness-related school absence. All four schools saw a significant decrease in absence related to contagious illness.⁹ The sanitizer was placed in very accessible locations. Each student used it anywhere from 1.5-5 times each day.⁹

To increase the availability and student compliance of hand hygiene, I am proposing that the University of Tennessee install four hand sanitizer dispensers on each floor in Massey Hall, two at the restroom exits and two at each elevator. The dispenser at each restroom exit will encourage students to eliminate any microorganisms on their hands after using the restroom facilities. The second dispenser encourages regular hand cleansing. All dispensers were not placed in the bathroom specifically to preserve and encourage hand washing and prevent students from strictly using the hand sanitizer.

Resulting Benefits

Benefits for students

The most obvious benefit for Tennessee's students is decreased illness and improved health. In the University of Colorado study, the experimental group who effectively used hand washing in combination with hand sanitizer experiences 26% fewer illnesses than the control group.⁷ The improvement of reported symptoms of illness improved as indicated in Table 1.

Table 1. Reported Symptoms⁷

Symptom	Improvement over control (%)
Sore throat	14.8
Stuffy nose	14.8
Ear pain	34.1
Painful/swollen neck	39.9
Cough	30.5
Chest congestion	31.8
Sinus pain	31.7
Fever	31.9

The improved health of University of Tennessee students will also result in decreased class absences. In an elementary school research study, the use of Purell in combination with frequent hand washing resulted in a 19.8% reduction in school absence.⁹ A similar reduction was indicated on the college level.^{1,9} Increased class presence and participation will positively affect the student's performance and achievement. Class participation is also directly improved, and subsequently enhances the learning environment for both the student and teacher.

Benefits for the University

By initiating this proposal, the University will see an overall improvement in student health resulting in significant savings in Student Health Center funds. Based on information from Grainger, Inc. and University statistics, this proposal can be estimated to be successful at a minimal cost. There is an initial start up cost to purchase the hand sanitizer dispensers. Each dispenser is sold to the University at a price of \$30.33. With a total of 28 dispensers in Massey Hall, the total price for purchase would be \$849.24.

Research conducted to evaluate the use of a similar program in elementary school's found that students used an average of 1.0 to 2.4 mL of hand sanitizer per day.⁹ Assuming the residence hall students use the maximum amount (2.4 mL), overall cost of the proposal can be evaluated. Each side of a floor on Massey Hall will contain two 1200 mL dispensers, for a total of 2400 mL. Assuming maximum occupancy of 42 girls per side, each student would be able to use the maximum 2.4 mL each day and not run out of hand sanitizer for approximately 24 days. Based on the University Academic Calendar, the Fall Semester for 2007 is 114 days long. Therefore, the hand sanitizers would need to be changed 4.75 times in the fall. The replacement receptacles cost \$74.84 for four. To replace all 28 dispensers, it would cost \$523.88.

The total initial cost for the purchase and maintenance of the hand sanitizer dispensers is summarized in the following table:

Cost of Dispensers:	\$30.33 per dispenser	28 dispensers	\$849.24
Cost of Refills:	\$523.88 per replacement of 28 dispensers	4.75 changes per semester	\$2,488.43
Total Cost for Fall Semester 2007:			\$3,337.67

This total cost will decrease after the Fall Semester due to loss of the initial purchase fee. The total cost is also expected to be less than estimated. The maximum use of hand sanitizer and residence hall capacity was assumed for these calculations. Since the maximum use and capacity are not ensured, the cost could be decreased.

As mentioned previously, the students in a similar study at the University of Colorado who used hand sanitizer and hand washing experienced large percentages of improvement in illness symptoms than those who did not. The weekly illness rates showed improvements anywhere from 20-30% and the absenteeism data showed improvements of 40%.¹

Based upon the research in this study, it can be assumed that the University of Tennessee will see equivalent results. In relations to the significant decrease in symptoms and illness, I estimate that the University will see a decrease in the number of visits to the Student Health Center. This will result in significant cost reductions based on decreased visits, improved time management, and elimination of staff overtime. The University's Student Health Center will only benefit from the installation of this proposal.

The implementation of this proposal will also assist with the University's current "Make Orange Green" program. The UT Environmental Policy states that the University "aspires to serve as a model of environmental stewardship and integrity and to follow principles of good environmental conservation, waste reduction, and design on its Knoxville campus."¹⁰ By frequent use of alcohol-based hand sanitizer, the University will see a reduction in paper towel and water use. This decrease will directly contribute to eliminating wasteful use of water as well as the overuse of paper products.

Finally, the University will benefit as a result of their student's health. As mentioned previously, the students of Tennessee will improve academically as a result of decreased illness

and absence. With better performance, the University can boast higher grade point averages to interest prospective students. Healthier students are also more likely to actively participate on campus. This will improve the quality and quantity of activities the University is able to offer. The University will become more appealing in several academic and extracurricular areas.

Overall, the Clean and Healthy Hands proposal will benefit the University. By initiating these simple and affordable measures, the University will directly see a decrease in illness and an increase in positive, healthy behaviors. I encourage the University to seriously consider the effects of initiating this program, both for the betterment of student and University life.

Did you wash your hands?



Use soap &
water.

Rub hands for
20 seconds.

Rinse.

Dry with paper
towel.

Use towel to
turn off faucet.

clean
A

Your health is in your hands



© 2000 CDC

Figure 1.

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